NATIONAL AIR QUALITY SITE ASSESSMENT TOOL

BACKGROUND

- Interest in improving air quality associated with livestock production facilities
  - Odor, Particulate Matter (Dust), Ammonia (NH_3), Hydrogen Sulfide (H_2S), Methane (CH_4), Volatile Organic Compounds (VOCs)
- Field of study is still developing
- Opposing responses

BACKGROUND

- Different concerns for each and every producer/environmentalist/politician/scientist/ citizen

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AVAILABLE MODELS/TOOLS

- Livestock and Poultry Environmental Stewardship (LPES) curriculum (odor focused)
- Cfarm; Dairy GEM (Greenhouse Gas focused)
- Air Management Practices Assessment Tool (for swine; after problem area is addressed)
- Molly, COWPOLL
- National Air Quality Site Assessment Tool (NAQSAT)
  - Available at naqsat.tamu.edu

NAQSAT

- USDA/NRCS CIG program
- Lead by Dr. Wendy Powers (Michigan State University)
- Initiated in 2007
- Completed in 2010 (Version 1.0)

NAQSAT

Firefox | National Air Quality Site Assessment Tool

naqsat.tamu.edu

Overview | Disclaimer | Sponsors | Resources | Emissions | User Manual

National Air Quality Site Assessment Tool

Select a species to begin:

Swine	Broiler Chickens
Dairy	Laying Hens
Beef	Turkeys

NRCS

See a video about the tool or read the brochure.

Purpose: The National Air Quality Site Assessment Tool (NAQSAT) has been developed for the voluntary use of livestock producers and their advisors or consultants. It is intended to provide assistance to livestock and poultry producers in determining the areas in their operations where there are opportunities to make changes that result in reduced air emissions. Air emissions research from livestock production systems is increasing every year. NAQSAT is based on the most accurate, credible data currently available regarding mitigation strategies for air emissions of ammonia, methane, volatile organic compounds, hydrogen sulfide, particulates, and odor.

NAQSAT was designed to provide information and education, only. It is not intended to provide emissions data and/or regulatory guidance. All users receive a report of priority areas where improvements can be made,

Scores for each emission are generated upon online completion of NAQSAT. Scores reflect the degree to which an operation has incorporated all of the possible practices needed that would effectively minimize air emissions from the facility. Trade-offs may exist within a housing type that all categories of emissions cannot effectively be minimized. The tool considers the impact of diet, housing management, manure handling, management, transport, land application of manure, neighbor relations, and internal and nearby road management practices. Once areas where changes could be made are identified, resources to help implement changes are identified for the user. A user can run NAQSAT a second time with a proposed change included to determine the impact a change would have on emissions. Comparing results

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Beef | National Air Quality Site Assessment Tool

Note: Do not use your browser's back button to navigate this form.
Save often using the **Save Progress** buttons at the end of each section.

Animals and Housing

Note to User: Many farms may use more than one of the listed choices below. In order to allow the use of NAQSAT as a "What If" tool only one of the choices can be selected at a time. The user can click on "Get Results" for that selection and see how changing the answer will affect their results. If only a general overview is desired, identifying the predominant practice will accomplish that result.

Housing type:

- ○ Under roof - Enclosed pens
- ○ Under roof - Enclosed pack
- ◉ Dry lot
- ○ Concrete lots

Save Progress

Feed and Water

Collection and Transfer

Manure Storage

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Housing type:

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Surface comparison for average pen condition: *(Click on an image below; your selection will highlight in green.)*




Do you use surface amendments (straw, wood chips)?

- ○ Yes
- ○ No

Do you use properly constructed mounds?

- ○ Yes

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Dry throughout, with 4" or more of uncompacted manure

Do you use surface amendments (straw, wood chips)?

- ○ Yes
- ○ No

Do you use properly constructed mounds?

- ○ Yes


Do you use surface amendments (straw, wood chips)?

- (•) Yes
- ( ) No

Do you use properly constructed mounds?

- (•) Yes
- ( ) No

How fast does the surface water drain after a rainfall event?

- (•) Within 72 hours
- ( ) Remain wet for more than 72 hours

Do you use supplemental shade structures?

- (•) Yes
- ( ) No

Do you sprinkle pens for dust control?

- (•) Yes
- ( ) No

The runoff control pond is designed and operated for which of the following:

- (•) Evaporation
- ( ) Storage followed by land application
- ( ) Treatment
- ( ) Does not apply

( ) Concrete lots

Save Progress

- No

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- Concrete lots

Save Progress

Feed and Water

Collection and Transfer

Manure Storage

Land Application

Mortalities

On-farm Roads

Perception

Get Results | Save Progress | Copy Session

Select a new species and start over

What method is used to transfer the majority of manure from storage to the field?

- Pipe, closed channel, hose or drag hose
- Open channel
- Tank-type spreader or tanker
- Open spreader or truck
- Does not apply

Is the manure spilled at the loading station/area?

- Yes
- No

Save Progress

Manure Storage

Land Application

Mortalities

On-farm Roads

Perception

Get Results | Save Progress | Copy Session

Generate a report of your results.

Select a new species and start over

Effectiveness Results:

(Close / Go Back)

Your effectiveness score was not calculated for one or more categories below because some questions were left blank.
Close this window and complete any questions marked in red to get a score.

Width of white box identifies room for improvement to reduce emissions within each constituent of concern.
More white area signifies greater opportunities to make changes and reduce air emissions.

Click on a management category to quickly modify your answers.

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH_3)	Hydrogen sulfide (H_2S)	Methane (CH_4)	Volatile organic compounds (VOCs)
Animals and Housing						
Feed and Water						
Collection and Transfer	*Sheet not completed.*					
Manure Storage	*Sheet not completed.*					
Land Application	*Sheet not completed.*					
Mortalities	*Sheet not completed.*					
On-farm Roads	*Sheet not completed.*					
Perception	*Sheet not completed.*					

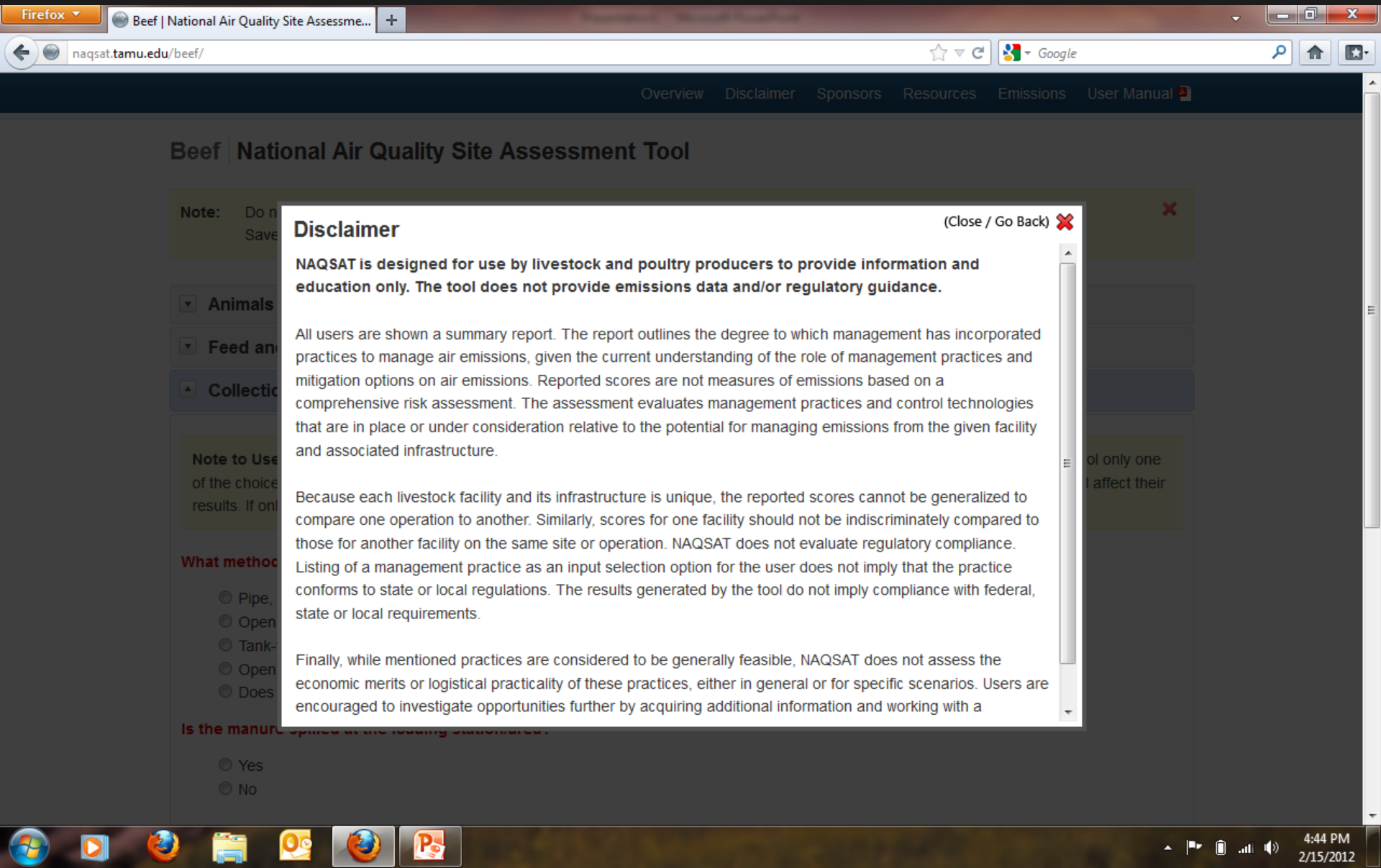
Print My Report

View a print version of your results, questions, and answers.

Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

http://naqsat.tamu.edu/beef/?key=063657b1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NAQSAT is designed for use by livestock and poultry producers to provide information and education only. The tool does not provide emissions data and/or regulatory guidance.
All users are shown a summary report. The report outlines the degree to which management has incorporated practices to manage air emissions, given the current understanding of the role of management practices and mitigation options on air emissions. Reported scores are not measures of emissions based on a comprehensive risk assessment. The assessment evaluates management practices and control technologies that are in place or under consideration relative to the potential for managing emissions from the given facility and associated infrastructure.
Because each livestock facility and its infrastructure is unique, the reported scores cannot be generalized to compare one operation to another. Similarly, scores for one facility should not be indiscriminately compared to those for another facility on the same site or operation. NAQSAT does not evaluate regulatory compliance. Listing of a management practice as an input selection option for the user does not imply that the practice conforms to state or local regulations. The results generated by the tool do not imply compliance with federal, state or local requirements.
Finally, while mentioned practices are considered to be generally feasible, NAQSAT does not assess the economic merits or logistical practicality of these practices, either in general or for specific scenarios. Users are encouraged to investigate opportunities further by acquiring additional information and working with a
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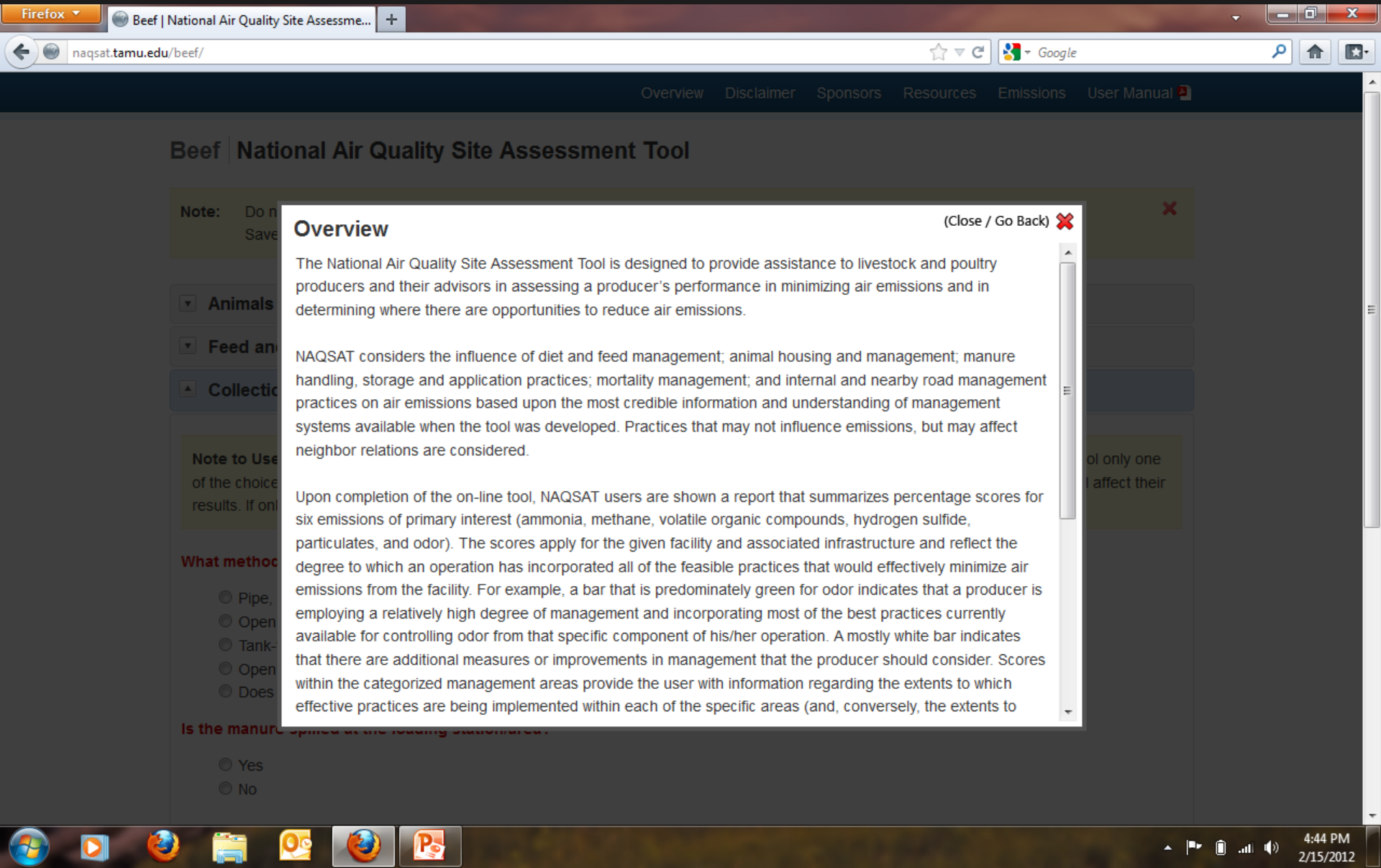
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The National Air Quality Site Assessment Tool is designed to provide assistance to livestock and poultry producers and their advisors in assessing a producer's performance in minimizing air emissions and in determining where there are opportunities to reduce air emissions.
NAQSAT considers the influence of diet and feed management; animal housing and management; manure handling, storage and application practices; mortality management; and internal and nearby road management practices on air emissions based upon the most credible information and understanding of management systems available when the tool was developed. Practices that may not influence emissions, but may affect neighbor relations are considered.
Upon completion of the on-line tool, NAQSAT users are shown a report that summarizes percentage scores for six emissions of primary interest (ammonia, methane, volatile organic compounds, hydrogen sulfide, particulates, and odor). The scores apply for the given facility and associated infrastructure and reflect the degree to which an operation has incorporated all of the feasible practices that would effectively minimize air emissions from the facility. For example, a bar that is predominately green for odor indicates that a producer is employing a relatively high degree of management and incorporating most of the best practices currently available for controlling odor from that specific component of his/her operation. A mostly white bar indicates that there are additional measures or improvements in management that the producer should consider. Scores within the categorized management areas provide the user with information regarding the extents to which effective practices are being implemented within each of the specific areas (and, conversely, the extents to
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- C.E. Meadows Endowment, Michigan State University
- Colorado Livestock Association
- Iowa Turkey Federation
- Iowa Pork Producers
- Iowa Pork Industry Center
- Iowa State University Experiment Station
- Michigan Milk Producers Association
- Michigan Pork Producers Association
- Michigan State University Extension
- National Pork Board
- University of California, Davis
- University of Georgia Department of Poultry Science
- University of Maryland Department of Animal and Avian Sciences
- Nebraska Environmental Trust
- Western United Dairymen

University Partners

- Colorado State University
- Iowa State University
- Michigan State University
- Oregon State University
- Penn State University
- Purdue University
- Texas A&M University
- University of California, Davis
- University of Georgia
- University of Maryland
- University of Minnesota
- University of Nebraska

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IOWA TURKEY FEDERATION

Iowa Pork Industry Center

pork IOWA PORK

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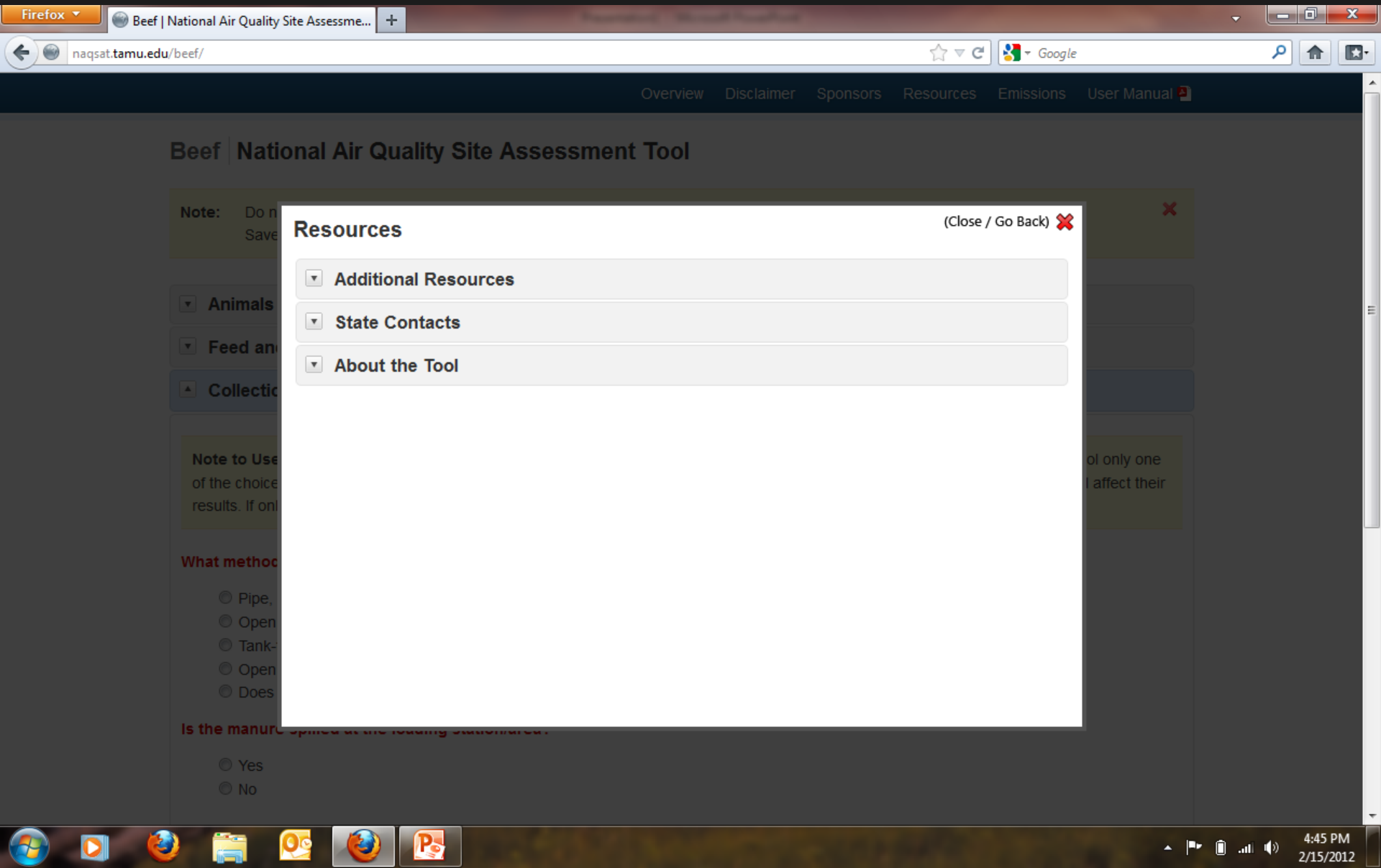
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- Yes
- No

Air emissions of concern

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The NAQSAT allows input and provides "Effectiveness Results" for the following constituents of potential concern.

Odor: Odors from livestock farms can be made up of hundreds of compounds (odorants). How these odorants interact with one another contributes to the specific character of an odor. Odorous compounds tend to be carried on dust particles, and, therefore, strategies to reduce odors from animal agriculture often include strategies to reduce dust.

Particulate matter (PM): Particulate matter, or dust, varies in size on the basis of source and formation. The primary concerns related to airborne particles are haze/visibility and health effects. Dust emitted from farms is highly complex in size, physical properties and composition. For regulatory purposes, airborne particulates are commonly classified into PM10 (≤10 µm in aerodynamic diameter) and PM2.5 (≤2.5 µm in aerodynamic diameter). Coarse particles (2.5 to10 µm in diameter) tend to be deposited in the upper airways of the respiratory tract; fine particles (PM2.5) can reach and be deposited in the smallest airways (alveoli) in the lungs. Farms can contribute coarse particles directly through animal activity, feed preparation, animal housing ventilation units and vehicular traffic. They can also contribute fine particles as the result of a secondary formation process (gas-to-particle conversion; see section on ammonia).

Ammonia: Ammonia is a colorless, pungent, nitrogenous gas. It volatilizes from a solid or liquid material when the ammonium ion is present and other physical conditions exist. Ammonia gas can react in the atmosphere

INVOLVED PARTIES

- Archibeque, Ham, Roman-Muniz, Engle, Han and Wailes (Colorado State University), Harmon and Rieck-Hinz (Iowa State University), Beede, Bolinger, Karcher, May, Powers, Rector, Rozeboom, Thelen (Michigan State University), Meyer (UC Davis), Angel (University of Maryland), Schmidt (University of Minnesota), Koelsch and Stowell (University of Nebraska), Martin (Western United Dairymen), Applegate (Purdue University), Auvermann (Texas A&M), Johnson (Washington State), Slutsky (La Luna Dairy), Hammerich (CLA)
- Local NRCS
- Producers


Questions?